

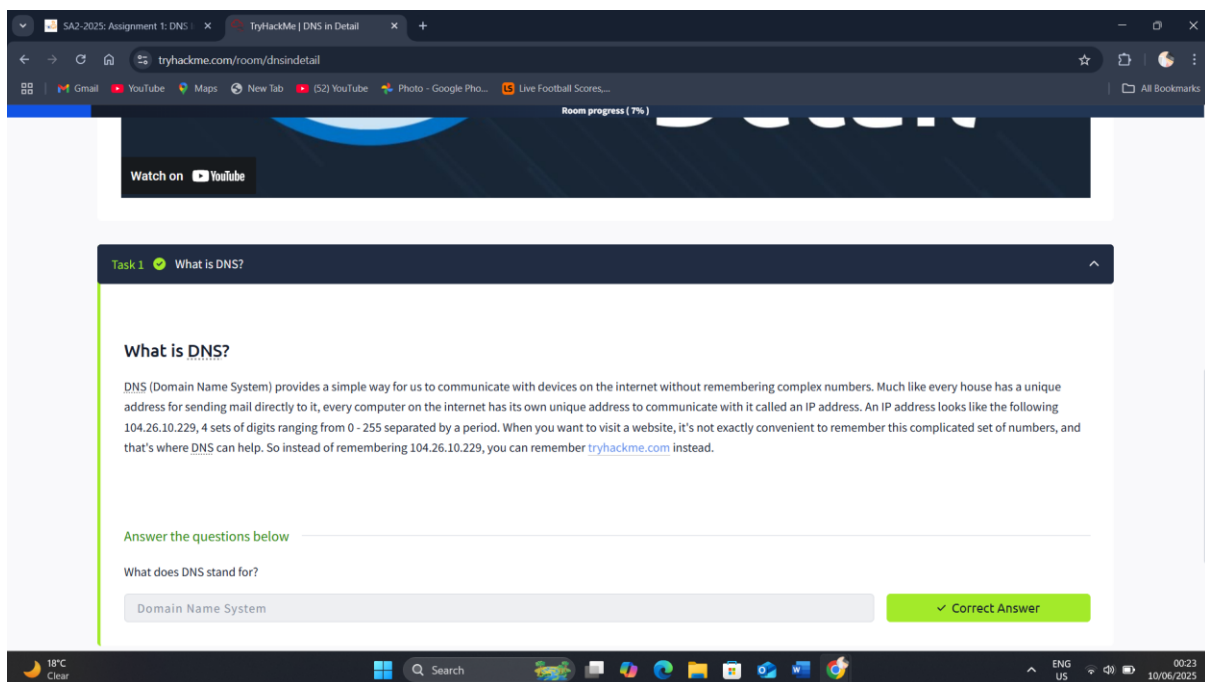
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MODULE:	DNS IN DETAIL ON TRYHACKME
COMPLETION LINK:	https://tryhackme.com/p/grahamoyigo19?show_achievem

DNS IN DETAIL ON TRYHACKME

This report will document the key concepts and practical applications learned from the DNS in Detail room on TryHackMe.

1. INTRODUCTION

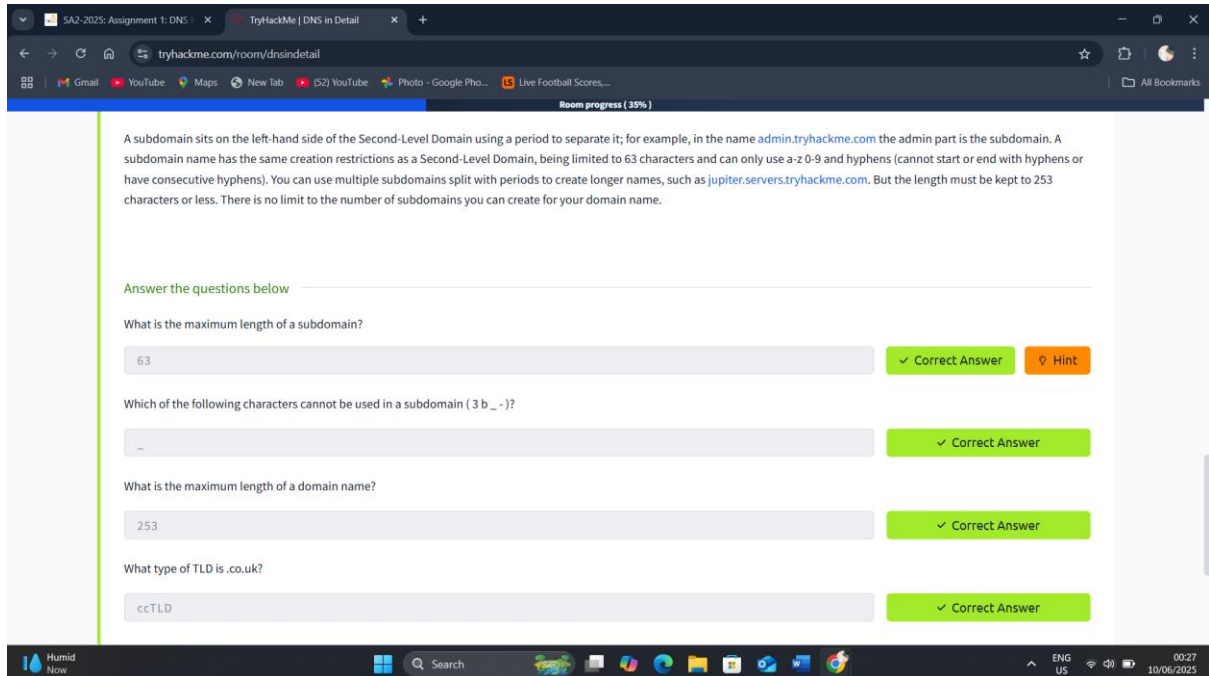
In this introductory task, I learned that DNS (Domain Name System) serves as a crucial system for simplifying internet communication. Instead of requiring users to remember complex numerical IP addresses (like 104.26.10.229), DNS allows us to access websites and other internet resources using memorable domain names (such as tryhackme.com). This system essentially acts as a translator, converting human-readable domain names into machine-readable IP addresses, making internet navigation much more user-friendly.



2. DOMAIN HIERARCHY

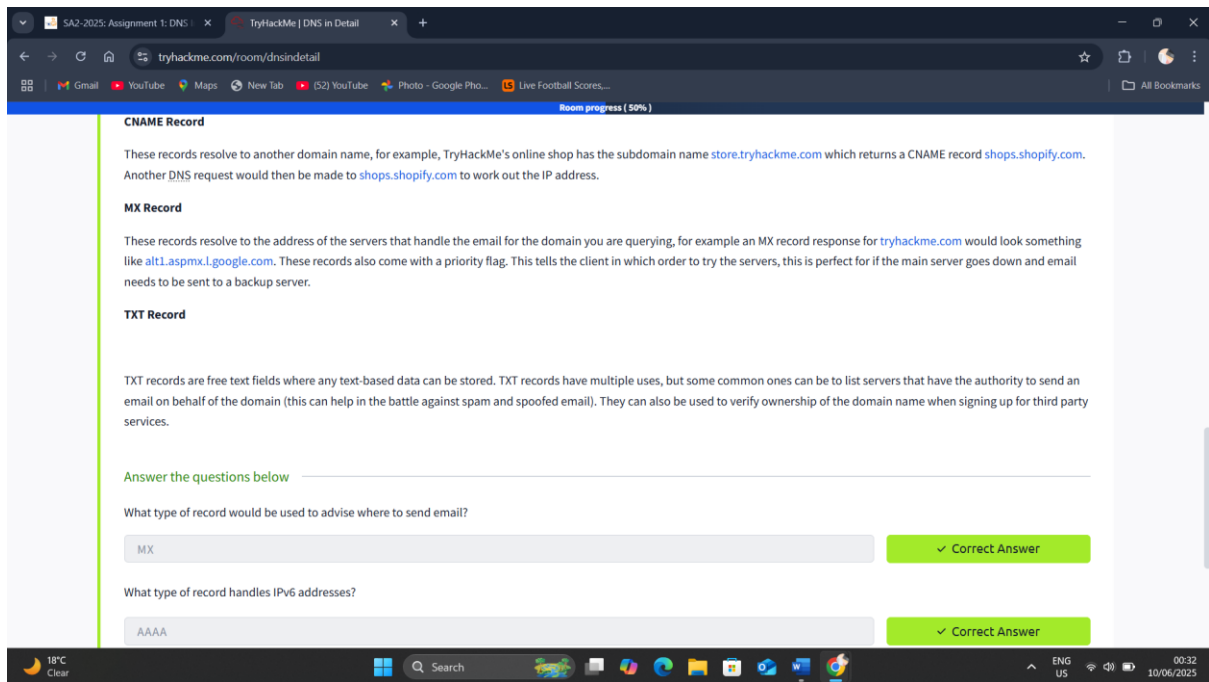
In this task, I learned about the hierarchical structure of domain names, starting with the Top-Level Domain (TLD), which is the rightmost part of a domain (e.g., .com, .org). TLDs are categorized as generic (gTLDs) or country code (ccTLDs), historically indicating purpose or geographical location, respectively, though many new gTLDs now exist. Moving left, the Second-Level Domain (e.g., tryhackme in tryhackme.com) is the unique identifier registered

by an individual or organization, adhering to specific character limits and naming rules. Further to the left are subdomains (e.g., admin in admin.tryhackme.com), which can be used to organize content or services within a main domain, also having naming restrictions but no limit on the number that can be created, as long as the total length remains under 253 characters.



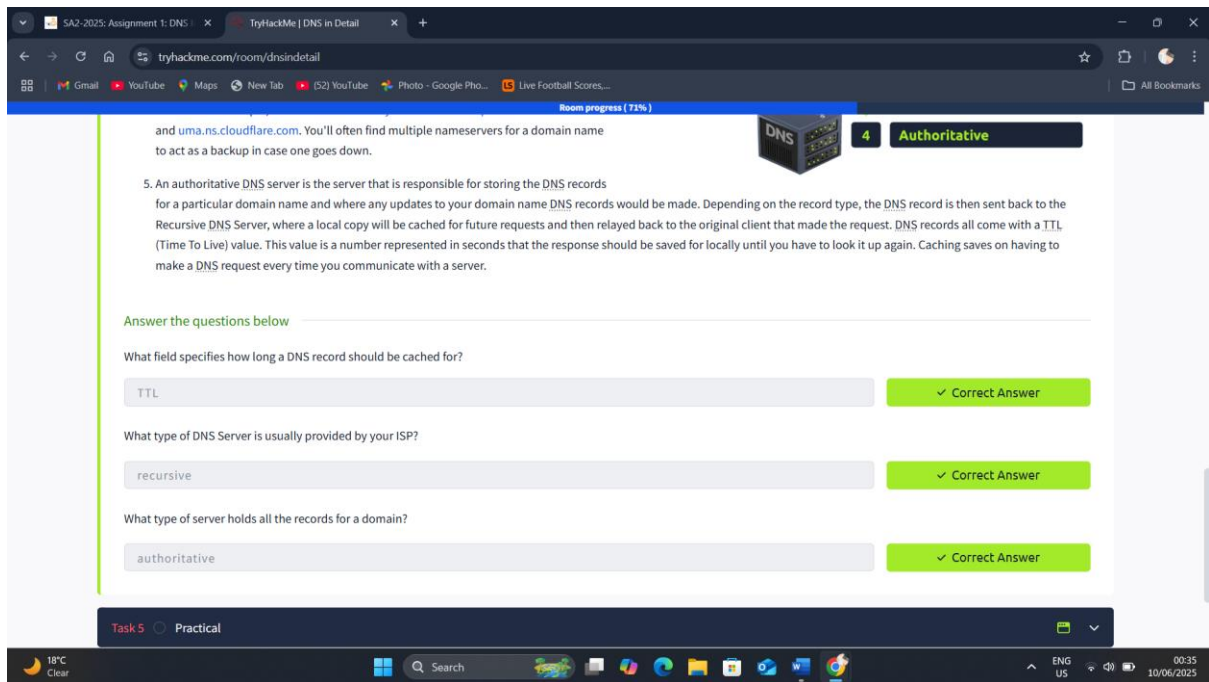
3. RECORD TYPES

In this task, I gained an understanding of various common DNS record types. I learned that A records resolve domain names to IPv4 addresses, while AAAA records resolve them to IPv6 addresses. CNAME records are used to point one domain name to another, requiring a subsequent DNS request to resolve the ultimate IP address. MX records specify the mail servers responsible for handling email for a domain and include a priority flag to dictate the order in which servers should be tried. Finally, TXT records are flexible text fields used for purposes like verifying domain ownership or listing authorized email senders to combat spam and spoofing.



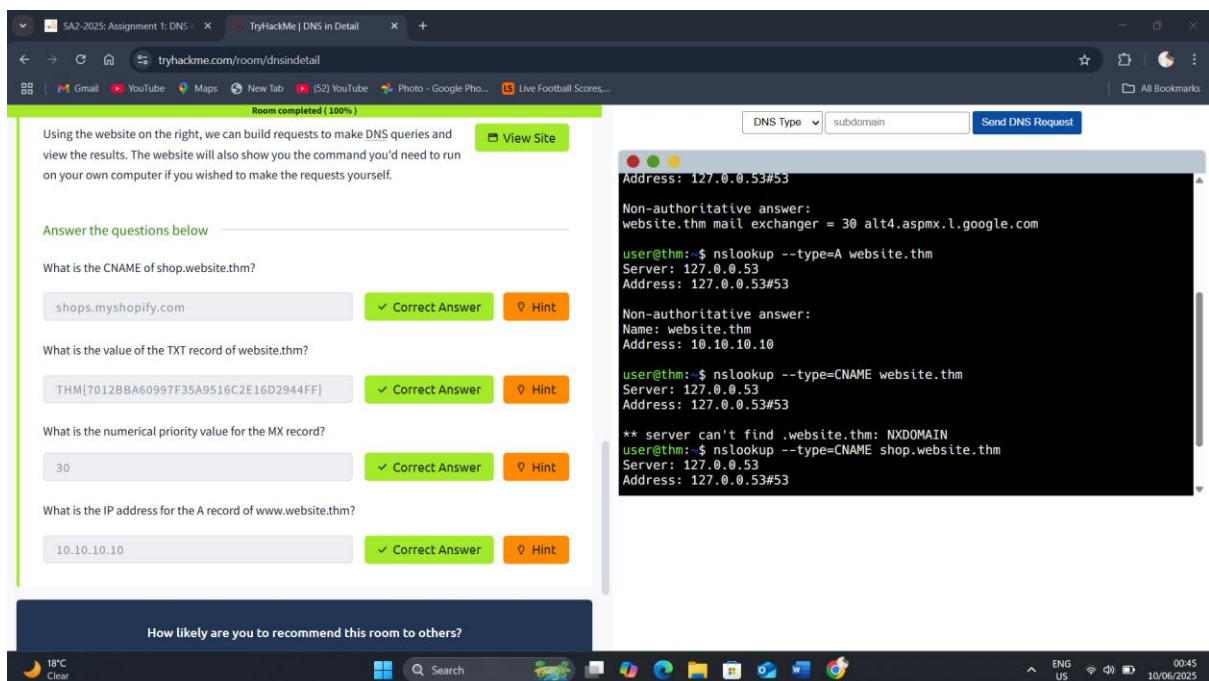
4. MAKING A REQUEST

In this task, I learned about the multi-step process of a DNS request. When a domain name is requested, the computer first checks its local cache. If not found, the request goes to a Recursive DNS Server (often from an ISP), which also checks its cache. If still not found, the Recursive DNS Server queries the internet's root DNS servers, which redirect to the appropriate Top-Level Domain (TLD) server. The TLD server then points to the authoritative DNS server (nameserver) for the domain, which holds the actual DNS records. Once the record is retrieved from the authoritative server, it's sent back to the Recursive DNS Server for caching (based on its TTL value) and then to the original client, optimizing future requests.



5. PRACTICAL

In this practical task, I learned how to apply the theoretical knowledge of DNS by building and viewing DNS queries using a provided website. This hands-on experience demonstrated how different DNS record types (such as CNAME, TXT, MX, and A records) can be queried, and importantly, it also showed the corresponding command-line syntaxes that would be used to perform these lookups on a personal computer. This reinforced the understanding of how DNS resolution works in a real-world scenario.



6. CONCLUSION

This room provided a comprehensive overview of the Domain Name System. I gained a solid understanding of how DNS translates human-readable domain names into IP addresses, its hierarchical structure (TLDs, second-level domains, subdomains), and the various types of DNS records used for different purposes. Furthermore, I learned the intricate process of a DNS request and had practical experience in querying DNS records, solidifying my foundational knowledge of this critical internet infrastructure component.

